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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/398,652	09/17/1999	WILLIAM A. SAMARAS	042390.P5120D	1359

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EXAMINER	
CHANG, RICK KILTAE	
ART UNIT	PAPER NUMBER

3729

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/398,652

Applicant(s)

SAMARAS ET AL.

Examiner

Rick K. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 19,21,22 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) 22,24 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19,21 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

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3. The following title is suggested: A METHOD OF ASSEMBLING A MULTI-CHIP DEVICE.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 19, 21, and 26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation “not coupling a microprocessor device to the substrate if . . . testing” in claim 19, last two lines is a negative limitation. Any negative limitation or exclusionary proviso must have basis in the original disclosure. See *Ex parte Grasselli*, 231 IUSPQ 393 (Bd. App. 1983), *aff’d mem.*, 738 F.2d 453 (Fed. Cir. 1984).

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 19, 21, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

How is the passing or failing of the cache memory affects the microprocessor device? Is the microprocessor device mounted on the interposer and then to a substrate or to a substrate alone? If the testing does not affect the microprocessor device, what prevents mounting of the processor on the substrate? Is the testing performed on the microprocessor and the substrate?

NOTE: No art rejections have been applied to the limitation "not coupling a microprocessor device to the substrate if . . . testing" in claim 19, last two lines since there are a great deal of confusion and uncertainty as to the proper interpretation of the limitations of claims. Therefore, it would not be proper to reject such claims on the basis of prior art. See MPEP 2173.06.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 19, 21 and 26, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Seidel (US 5,635,847) in view of Gedney et al (US 5,483,421), and further in view of Beers (US 5,680,936) and Sakemi (US 5,983,490).

Re claim 19: Seidel discloses providing an interposer (10); coupling solder balls (12) to the interposer (10) to selected locations; coupling a plurality of semiconductor dice (11) to the first surface (the surface where 11s are mounted); and testing the plurality of semiconductor dice (11) on the interposer (col. 1, lines 20-34 and col. 2, lines 46-51).

Seidel fails to disclose populating the second surface with a plurality of conductive pads; coupling the solder ball to each of selected ones of the plurality of conductive pads; coupling a plurality of cache memory devices and at least one passive device to the first surface; coupling the interposer to a substrate with the solder balls after the testing if the plurality of semiconductor

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dice pass the testing; testing the plurality of cache memory devices; not coupling solder balls to non-selected locations; and coupling a microprocessor device to the substrate.

Gedney discloses populating the second surface with a plurality of conductive pads (32); coupling a solder ball (44) to each of selected ones of the plurality of conductive pads (32); coupling the interposer (24) to a substrate (38) with the solder balls (44); and coupling at least one other semiconductor device (Fig. 4 shows a third semiconductor device (20 and 24) is mounted on 38) to the substrate (38) thereby forming a multi-chip subassembly and mounting this subassembly to printed circuit cards (col. 1, lines 7-8) without any defective components.

Beers discloses coupling at least one passive device (see annotated Fig. 3 below) thereby regulating voltage and current to the electronic dice.

Sakemi discloses not coupling solder balls to non-selected locations (where marked BM) thereby saving production cost.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by populating the second surface with a plurality of conductive pads; coupling the solder ball to each of selected ones of the plurality of conductive pads; coupling the interposer to a substrate with the solder balls after the testing if the plurality of semiconductor dice pass the testing; and coupling at least one other semiconductor device to the substrate, as taught by Gedney, for the purpose of forming a multi-chip subassembly and mounting this subassembly to printed circuit cards without any defective components.

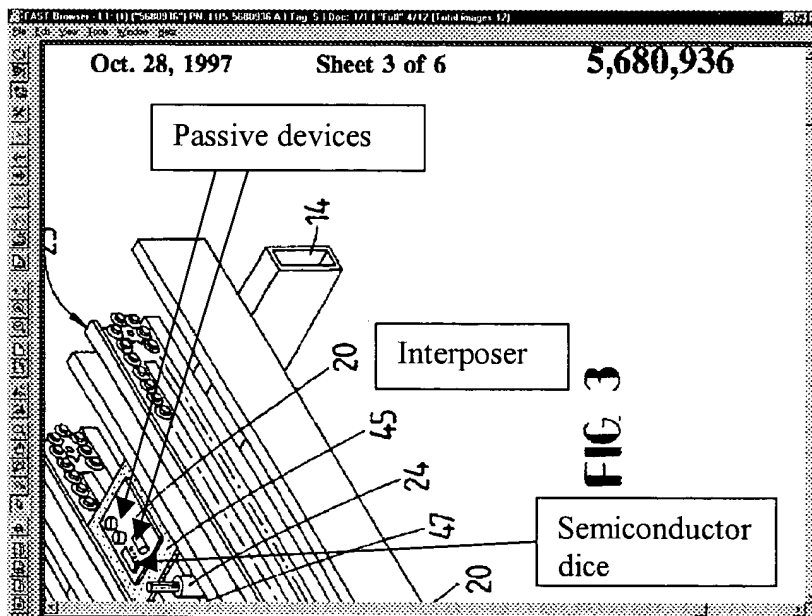
Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by not coupling solder balls to non-selected locations, as taught by Sakemi, for the purpose of saving production cost.

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Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by coupling at least one passive device to the first surface of the interposer, as taught by Beers, for the purpose of regulating voltage and current to the electronic chip.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to incorporate a plurality of cache memory devices and a microprocessor device to use in a computer to perform computation and temporarily store program applications.

Therefore, it would have been an obvious matter of design choice to modify Seidel to obtain the invention as specified in claim 19.



Re claim 21: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose providing the interposer having organic material.

Gedney discloses providing the interposer (24) having organic material (col. 7, lines 15-16) thereby providing low thermal coefficient of expansion.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by providing the interposer having organic material, as taught by Gedney, for the purpose of providing low thermal coefficient of expansion.

Re claim 26: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose creating a plurality of contacts on the substrate; and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts.

Gedney discloses creating a plurality of contacts (42) on the substrate (38); and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts (Fig. 5 shows conductive pads 32 are electrically connected to the contacts 42 via solder balls 44) thereby allowing signal to travel from one part of the component to another and providing power and ground to the device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by creating a plurality of contacts on the substrate; and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts, as taught by Gedney, for the purpose of allowing signal to travel from one part of the component to another and providing power and ground to the device.

#### ***Response to Arguments***

10. Applicant's arguments filed 10/14/02 have been fully considered but they are not persuasive.

Col. 2, lines 49-50 disclose testing the chips together with the structure.

#### ***Interviews After Final***



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**11. Applicant note that an interview after a final rejection will not be granted unless the intended purpose and content of the interview is presented briefly, in writing (the agenda of the interview must be in writing) to clarify issues for appeal requiring only nominal further consideration. Interviews merely to restate arguments of record or to discuss new limitations will be denied. See MPEP 714.13 and 713.09.**

*Conclusion*

**12. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.**

**13. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

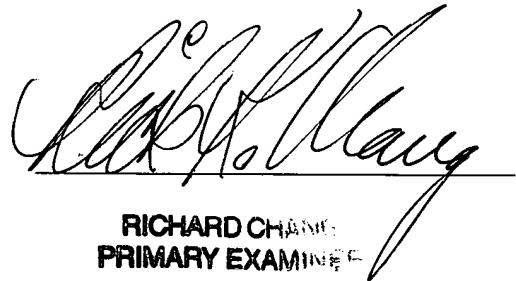
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick K. Chang whose telephone number is (703) 308-4784. The examiner can normally be reached on 5:30 AM to 1:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (703) 308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.



**RICHARD CHANG**  
**PRIMARY EXAMINER**

RC  
December 7, 2002